DEM-CFD SIMULATION FOR MIXING PROCESS OF BINARY PARTICLES WITH LARGE SIZE DIFFERENCE IN A BUBBLING FLUIDIZED BED

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In practical applications of fluidized beds, the size of solid materials is not uniform and large solids coexist with small solids. The large size difference significantly influences the mixing and segregation phenomena in the beds. However, these behaviors are not fully understood. In the present study, a large-scale DEM-CFD coupling simulation (1) for a pseudo-2D bubbling fluidized bed of binary particles with large size difference is performed. Momentum exchange between larger particles and fluid is expressed by fictitious particle method by Tsuji et al. (2). A particle mixture consists of two kinds of spherical particles with 1 mm diameter and 2500 kg/m3 density and 20 mm diameter and 1600 kg/m3 density. The number of the smaller particles is twenty five million and that of the larger particles is five hundred. The particle mixture is initially in completely separated state, and mixing process of the particles is investigated. The snapshot of the simulation result is shown in Fig. 1. We can observe that the large particles are mixed by bubbles occurring in the bed.

REFERENCES

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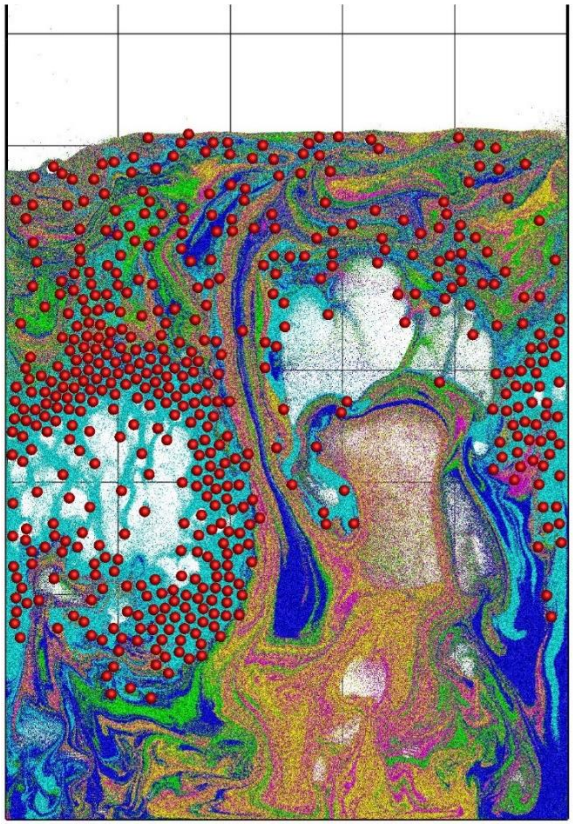

Fig.1 Simulation of bubbling fluidized bed including twenty five million small particles and five hundred large particles